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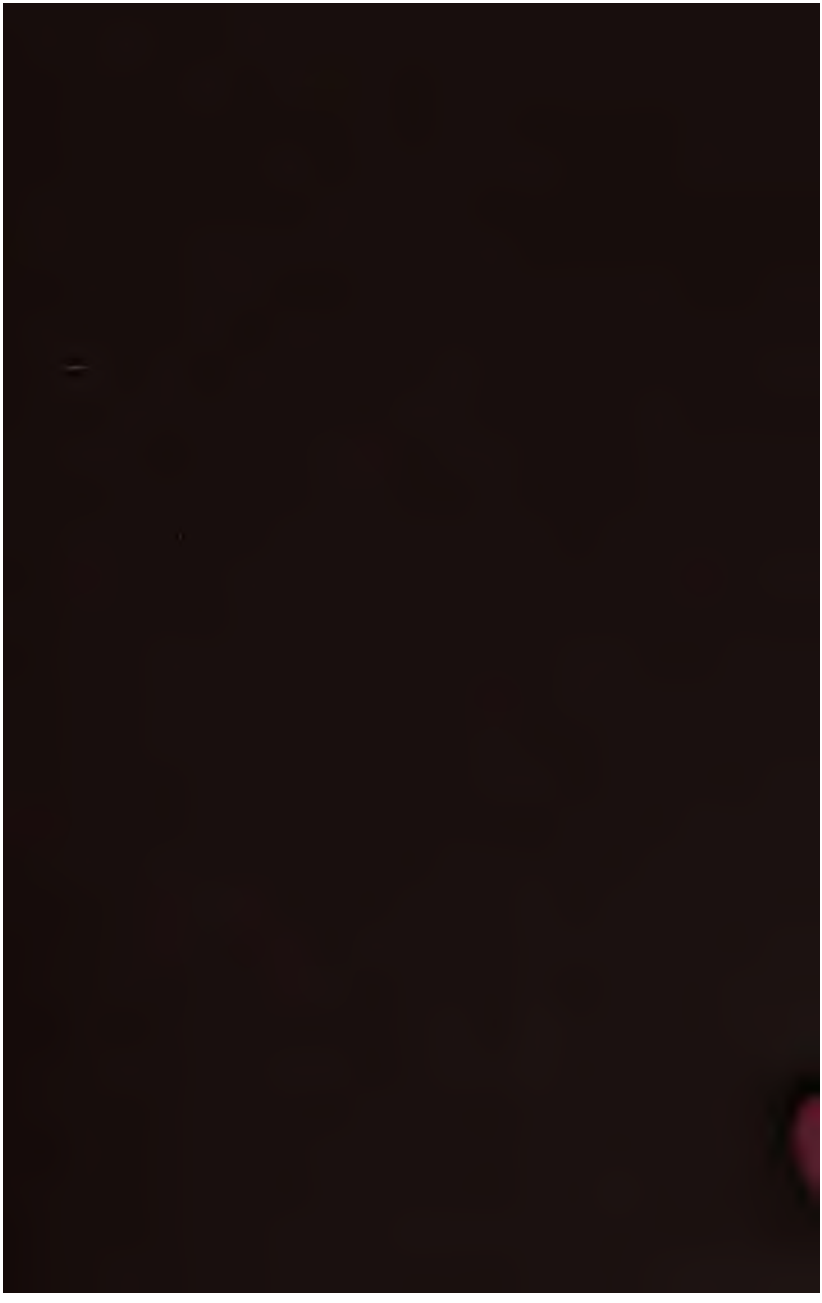

Medical Static Electricity.

TREATMENT

OF

NERVOUS AND RHEUMATIC AFFECTIONS

BY

STATIC ELECTRICITY.

BY

DR. A. ARTHIUS.

TRANSLATED FROM THE FRENCH BY

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NOTICE TO THE READER.

The following translation was made from a desire to contribute to the literature of a subject, scarcely known to young American Physicians. The use of Static Electricity, in a primitive form, in treating diseases, was well known to medical men in this country, fifty years ago. The application of it, as recommended by the author, is wholly new.

The "Fluidique bath," spoken of so frequently, means a bath of *electric "fluid."* No English word expresses the meaning of "fluidique," so the French adjective is retained.

The translator is indebted to a friend for a copy of the original,—she having received it from a relative in Paris, who was cured of an obstinate nervous disorder by Dr. Arthius' new method.

Arthius

Chicago, Dec. 26, 1873.

INTRODUCTION.

STATIC ELECTRICITY is destined to render most important service to the medical art.

Of all the treatments of *Nervous Diseases and Rheumatic Affections* now in vogue, none is to be compared, for efficacy, to the electrical treatment, which we advocate. Still, we are the first to aver that Electro-therapy is yet in its infancy.

From time to time great works have been accomplished by our predecessors; it is but justice to state this. But the best of them fail singularly in method, and present, the rather, only gropings and brilliant experiments, instead of decisive conquests. Like other things which have presented obstacles, Electricity has more than once discouraged its adepts. Therefore, till this time, it has

seemed to shine only with occasional brilliancy; and, in the estimation of many practitioners, it has not yet left the domain of empiricism.

Many causes have conspired to this result, and chief among them has been the confounding of *Dynamic* and *Static* Electricities.

Many a time have we received responses of this kind: "Do not urge it; I have already tried Electricity, but without success."

Or else:—

"Do not talk to me about Electricity; it is atrocious."

To which we invariably respond:—

"Try *ours*."

"How about *yours?* Are there two kinds of Electricity, Doctor?"

"Oh, yes; there are two kinds of Electricity. One, called *Dynamic*, generated artificially, by piles; it is this which you have tried and found so little successful. The other, called *Static*, is generated by simple friction, and is analogous to natural

Electricity, contained in the air which we breathe; this is *ours.*"

Dynamic Electricity, as we shall show in this work, is often dangerous, rarely efficacious. The number of diseases it can cure is very limited. Produced by the chemical decomposition of metals, attacked by powerful acids, it carries with it, into the organism, enough of their original elements to frequently cause great troubles. Nearly always the patient dreads it, and receives it only with reluctance.

Static Electricity, on the contrary, *our* Electricity cannot in a single case be dangerous; even when it is not curative, it is beneficial. This is, preëminently, a regulator of the functions, a dispenser of harmony, a distributor of equilibrium; and it introduces into the organism some foreign substances, in the fluidique form, which are only the medicaments designed by the physician, and appropriate to the malady which he wishes to combat.

How many times have we not relieved, even cured, patients previously aggravated by the use of Voltaic Electricity?

But what prejudices, what resistances to overcome, by the kindness of a deplorable ambiguity. The design of this book is to correct this. If it succeed, the author will never regret his trouble.

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MEDICAL STATIC ELECTRICITY.

I.

HISTORY OF MEDICAL ELECTRICITY.

A few years after the discovery of the Electrical Machine, about 1744, Electricity began to applied to the treatment of diseases. Kruger, a professor in Helmstadt, first employed it as a curative means, and the trials of it which he made were successful. Two years later, in 1746, when the effects of the Leyden Jar became familiar, a great terror was excited by it, suddenly, because of its very power. Herman-Klyn cured, by means of this apparatus, a woman, paralyzed two years; he carefully avoided strong discharges, and used only sparks and very slight electrical shocks. In 1748, Jallabert of Geneva, cured a patient with a

paralysis of the right arm, of long standing, following a hemiplegia, produced by a violent fall. Jallabert made use of sparks and a few moderate shocks, and obtained a cure in two months.

After these observers came the Abbé Nollett, Privat (of Venice) etc., who studied the effects of Electricity on different diseases.

Encouraged by the successes of these learned experimenters, Lindahl, a Swedish physician, followed in their footsteps, and obtained, in 1753, a remarkable cure of chorea, or St. Guy's dance, at the same time that another practitioner cured a case of epilepsy, both grave and inveterate.

Ten years later, in 1763, Doctor Watson cured a case of general tetanus, against which all the remedies, then vaunted against this terrible affection, were uselessly employed.

Finally, a great number of remarkable cures having been described in the treatment of the most rebellious nervous diseases, *Static Electricity* definitely took the important place in medicine to which it is entitled.

But at the end of the last century, in 1789,

Galvani made his grand discovery, and soon afterwards Volta invented the pile which bears his name. The power of the Voltaic machine much exceeded that of the primitive Electrical machine. Moreover the pile worked at all times, and seemed insensible to the atmospheric variations which sometimes paralyzed the action of the ordinary machine. In a word, a constancy of effect was obtained with the pile, such as was natural to give to it the preference, and it is this which really gave it (preference). Static Electricity was partly abandoned, and replaced by the continuous currents. But the results were far from answering the general expectation; the numerous experiments which were made in France, and at the same time in Germany, showed that the continuous currents not only achieved cures much more rarely, but that they afterwards produced the most grave accidents.

Nevertheless they were used up to 1832, a period in which Faraday, the illustrious English physician, discovered the currents by induction, and thus furnished to medicine a source of Elec-

tricity, energetic and of easy employment. Induction currents entered immediately into therapeutics, and were applied by the aid of two kinds of apparatus: one called the *Electro-magnetic* machine; the other, the *Magneto-electric* machine, according as the currents were induced by the direct currents of the pile, or by the magnet.

For some years, piles, more manageable and constant than the early ones, having been discovered, the continuous currents were again used, to the detriment of induction currents, which are still much used.*

To recapitulate, we use to-day in medicine two Electricities, absolutely different in their origin, in their physiological effects, and especially in their therapeutical results. The one, called *Dynamic* Electricity, meaning Voltaic Electricity and Electricity by induction; the other, *Static*, or Frictional Electricity.

* Let us say, in passing, that the pile most used now, for producing continuous currents, is that of Ramak, of which each element, as every one knows, is composed of two metals, zinc and copper, and of two liquids, acidulated water (water and sulphuric acid) and a solution of sulphate of copper.

Each of these electrical methods has its partisans and its adversaries. As to ourselves, we have pronounced vigorously in favor of Static Electricity, which gives the most happy results in diseases considered incurable, and which is always exempt from danger, even to the most delicate persons, such as females and the youngest children.

We are engaged only in the employment of Static Electricity; we see the great perfections it has received, and the immense services which it can render to medicine and humanity. But, having begun this study, it is necessary to explain why we prefer it to Dynamic Electricity; we now pass on to say a few words of the inconveniences and the dangers which the use of the latter presents to our view.

II.

INFERIORITY OF DYNAMIC ELECTRICITY: ITS DANGERS.

The continuous currents are to-day quite the fashion, and in almost universal usage in the application of Medical Electricity. Extolled by specialists, they owe their efficacy to their very essence (continuity of action) and to their indifference to atmospheric conditions; in all kinds of weather, in all seasons, the Voltaic currents act with uniformity, and it is known that their constancy never leaves the operator in default.

But it must be immediately said, these currents derive their origin and power from chemical decomposition. Dynamic Electricity participates, necessarily, in the very elements which compose the generating pile.

It is not the point of contact of heterogeneous

bodies which develops Electricity, but rather the chemical actions which take place in these bodies when they are put together. The quantity of Electricity developed by a pile depends, consequently, upon the power of chemical action, and upon the quality of the agents in decomposition. Hence, it is easy to understand all the disorders which can be produced in an organism as delicate as ours, all the corrosive currents, saturated with violent acids, which destroy everything, from flesh even to metals.

The dangers of Dynamic Electricity are very great, and its use demands a particular prudence. Open the works of Dr. Duchenne (of Boulogne), of Drs. Onimus and Legros, the conceded apostles of this method, and you will see upon almost every page, the most alarming therapeutical results. It is by their own avowals that we establish the proof of what we say, and we are only embarrassed for a choice in our citations.

Every one knows the Voltameter (Fig. 1), an instrument used to decompose water by means of the pile; that oxygen is carried to the positive

pole, and hydrogen to the negative pole, and that the volume of hydrogen is double the volume of oxygen.

This decomposition of water by Voltaic Elec-

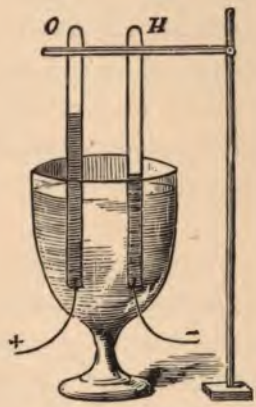

FIG. 1.

tricity is capital, in that it shows that the currents in passing across a compound body, decompose it.

If from this we arrive at the chemical effects upon the human body of the pile, we note the disorganization of the skin, an extremely painful morbid phenomenon; and if the application be

prolonged, we see all the symptoms of an acute inflammation rapidly supervening. In women and children, whose skin is finer than that of a man, the continuous currents, when they do not disorganize the skin, very often determine the appearance of small vesicles, which leave after them a brown scar, very slow in disappearing, or give rise to furuncles, more or less obstinate.

The surgeon utilizes this corrosive property of the continued currents, to break down living tissues and tumors of various kinds, as constrictions, polypi, cancers, etc. Doctors Malley and Tripier have often obtained, by this means, cures of urethral strictures. Doctor Tripier has, more than once, attributed to the action of continuous currents, a notable reduction of the volume of the prostate in cases of hypertrophy of that organ. Professor Nélaton has cured, by the same means, a voluminous tumor of the nasal fossæ. "This tumor," said this illustrious surgeon, "was very vascular, gave rise to hæmorrhages by the least contact, and had been treated with the most energetic substances without success. It was broken

down in six sittings, by implanting the two electrodes in the mass."

Thus, are the continuous currents able to disorganize tissues, and, moreover, by the decomposition of metals and acids, which make up the pile, they introduce into the organism toxic elements, which can produce great troubles. We give only a few examples which have presented themselves within the past few years.

M. Becquerel * cites a case of a young woman, to whom Dynamic Electricity was administered for neuralgia during the menstrual flow, and the latter was immediately checked. Doctors Onimus and Legros,† who confirm this fact, say that the continuous currents can, on the contrary, produce the opposite accident, *i. e.*, hæmorrhages, more or less grave.

In a case of progressive locomotor ataxia, Doctor Onimus applied the continuous currents to the

* "Treatise on the Applications of Electricity to Medical and Surgical Therapeutics." By Dr. Becquerel. 1860.

† "Treatise on Medical Electricity." By Drs. Onimus and Legros. 1873.

spinal cord. After a few sittings, the patient was suddenly seized with a spitting of blood. Doctor Onimus honestly says, "This patient never had an hæmoptysis, and surely, although we may admit a coincidence, we easily believe that Electrization was the cause of this accident."

In another patient, troubled with amaurosis, and treated by the same physician, epistaxis unexpectedly supervened upon each Electrization.

When the induction currents are employed, as was done by Doctor Duchenne, we expose ourselves to much the greatest dangers. Doctor Duchenne reports an accident which happened to a patient whom he electrized for a right hemiplegia, supervening upon a cerebral hæmorrhage, dating back two years and a half. "One day," says the author,* "as Electrization of the muscles of the face and tongue, upon the right side, was being practiced, with considerable force, the patient was seized almost immediately with a new apoplectic attack, which necessitated many bleedings."

This accident which, according to the view of

* "Localized Electrization." By Dr. Duchenne (of Boulogne). 1872.

the operator himself, had placed the patient's life in danger, is not an isolated instance; it is, on the contrary, frequent, since, out of ten cases of facial hemiplegia, arising from cerebral causes, to which Duchenne had applied localized Faradization, cerebral phenomenon, more or less grave, have supervened upon the operation three times.

When more delicate parts, as the optic nerve, for example, are acted on, still greater dangers are incurred. In his book, Doctor Duchenne cites an accident of this kind, in one of the patients, affected with paralysis of the muscles of one side of the face. "One day," he says, "as I was using the galvanic apparatus, and as I directed the current upon the paralyzed muscles, which contracted very feebly, the patient perceived at the same instant a considerable flame in the eye of the corresponding side, and he wrote: 'I see your room all on fire.' He besought me to suspend the operation. When he experienced again the dazzling occasioned by the same strong excitation of the retina, he complained of considerable trouble of vision, and perceived that he could

not see any more, on the side where the operation was carried on. The eye of the opposite side did not seem to have suffered. I made him take a foot bath immediately; when he was taken home a blood-letting was performed. But his vision did not improve; in spite of the employment of a series of excitant means, and a rational treatment not the least amendment was obtainable. Vision remains considerably impaired."

We can multiply infinitely our citations, but have we not already said enough to show how we ought to be reserved in the use of Dynamic Electricity?

Far be from us the thought to reject it in a peremptory manner, yet it is a violent, painful, disturbing means, and so rarely efficacious that it ought to be confined to the treatment of a few surgical affections, and to certain paralyses of the limbs, where a violent excitation is not to be feared.

But when it acts upon delicate organs, when, particularly, it has to do with nervous affections, which need soothing and restraining, not only

does Dynamic Electricity do no good, but it may lead to the greatest dangers.

Finally, let us note the accidents of what Doctor Duchenne calls Electrization, or *localized* Faradization. First, let us say, in passing, that we are very far from admitting the localization of the electric current in any particular part of the body. This localization does not and cannot exist, whatever be the electrical proceeding which we employ, or the part to which it may be applied; quite to the contrary, in all cases and always, the nervous centers are influenced. How can we think to impose limits to an agent so subtile, so expansive as the electric fluid? We do not deny that Doctor Duchenne can contract, individually, each muscle, or each muscular fasciculus, by holding, very closely, humid rheophores placed over points of the skin corresponding to the surface of the muscle on which he wishes to act. But the muscular contraction is the coarse fact, and it is evident that the nerves of the part which is electrized are influenced by the electric current, and transmit, immediately, the influence which they have re-

ceived to the nervous trunk and to the nerve centers themselves. And the proof is what Doctor Duchenne observes, "that localized Faradization occasions the flashes, the sensation of weakness, the general numbness, the nausea, the vomiting, the troubles of circulation and respiration, even when the operation, very gently performed, does not produce a single local sensation."

It would be easy for us to cite a certain number of accidents, developed by Doctor Duchenne while he practiced Faradization of certain muscles, but *cui bono?* Does not Doctor Duchenne, while he speaks of the general effects of localized Electrization, sufficiently refute himself by the very terms he uses?

Finally, it is this which especially concerns patients who demand only one thing, a cure for their ills, that the therapeutic results of Dynamic Electricity leave much to be desired. In order to be convinced, it suffices to open the special works which have appeared recently, and we are convinced that the number of cures is most limited. Excepting certain paralyses, upon which we have said Voltaic Electricity has a particular action, it

is wholly inefficacious in most of the nervous diseases. It never produces the good results in those numerous cases where, from some cause, the organism is enfeebled and needs, not a violent excitant, but a potent restorer, which Static Electricity alone can furnish.

Many a time have we obtained, by our method, in a few months, sometimes in a few weeks, cures of affections which, for years, had been inefficaciously treated by induction currents, and by continued currents!

Let us pass on to the study of Static Electricity, generated by friction, which derives nothing from chemical decompositions, and which is subject ever to the conditions of the atmosphere in which it acts. Thanks to the perfections which it has received, Static Electricity answers to all the therapeutical needs of the diseases which are in this department, also of those that it cures the most frequently; and we affirm, without fear of contradiction, even in those very rare cases where it does not radically cure, it always relieves and ameliorates, in a singular manner, the general state of the patient.

III.

STATIC ELECTRICITY.

OPERATIVE PROCEDURE.

From the earliest applications of Electricity down to our day, Static Electricity has received modifications and improvements without number. It certainly would not be without interest to follow it from its commencement, and see the phases through which it has passed, down to our day; but it would be foreign to our design, and moreover, the subject is of sufficient importance to deserve being the object of a separate work, which we shall publish at some future time.

We are contented to expose the method, such as it is to-day, *i. e.*, with all the additions, the modifications, and the improvements, which it has received from all those who have studied it.

But being obliged to know the different proceedings, by the aid of which Medical Electricity is administered, it is necessary to say a word about the apparatus which produces it.

ELECTRIC MACHINE.

The Electric Machine is composed,

First, of a plate of glass, of a greater or less diameter, held vertically by means of an axle, to which a crank communicates, as desired, a rotary movement;

Second, of two pairs of cushions, covered with a skin, coated with mosaic gold (deuto-sulphide of tin), or with the oxide of gold, which press the plate between them, and are in communication with the ground, the common reservoir;

Third, lastly, of a metallic conductor, isolated by means of a support of glass, and terminated by the side of the plate, and very near to it, by points more or less numerous.

When the crank is turned, the glass plate, by its friction upon the cushions, becomes charged upon its two surfaces by vitreous or positive elec-

dimension, we have a sufficiently powerful machine, and one that answers all the needs of practice. But the part of most importance is the metallic conductor.

In all machines this piece is, without exception, of copper. When we come to explain the phenomena of transport it will be easily understood what an enormous error our predecessors committed. They believed in transport, but did not see that it takes place not only from the excitator (or excitor), but from the source (*i. e.*, from the machine). A person who is upon the insulator receives gold from the excitator — if the excitator used be of gold — and copper from the machine. How, in most cases, can one derive benefit from such a melange, and hope for a complete result from such a proceeding?

There are some practitioners who connect the patient with the machine by means of a silver spiral. Far from lessening the inconvenience which we point out, they increase it still more, for in place of two different influences, the patient is subjected to a third one at the same time — gold, silver, and copper.

Does not what we speak of appear, in this respect, very evident, that the conductor from the machine, which stores up the Electricity, and which communicates it to the patient, ought always to be of the same metal as the excitator used? There should be as many conductors as excitators. When, for example, the disease calls for the use of gold, the excitator, the conductor, and the tube of communication ought to be of gold. In a word, the excitator, the conductor from the machine, and the tube of communication ought always to be of the same nature.

INSULATOR, OR ELECTRIC STOOL.

The insulator, or electric stool, is only a broad oak plank, the angles of which are rounded; it rests upon four glass feet, a little elevated, and covered with a varnish coating of gum lac, to render the insulation more complete. The insulator ought to be large enough to hold a chair, upon which the patient sits. (See Figs. 2 and 5.)

In very damp weather a part of the Electricity

escapes upon the surface of the glass feet, and is lost in the earth. To obviate this inconvenience, Bertholon* contrived what he called "a method of double insulation," which consists in placing each glass foot of the insulator in a goblet of the same substance.

There is another proceeding which insulates still more completely: the feet of the chair upon which the patient is seated are placed in goblets of glass, and on the front part of the insulator a glass plate is placed, large enough to allow the patient to put his feet upon it. In this way the Electricity cannot escape to the earth.

Finally, a third proceeding consists in covering the whole of the insulator with a sheet, rather thick, of hardened caoutchouc.

EXCITATORS.

The instrument called an excitator is a simple rod of metal or wood, with a point at one end and a ball at the other. The point gives the cur-

* "Electrizing the Human Body in a State of Health and of Disease." 1780.

rent and the ball the sparks. The material of the excitator varies according to the disease which is treated.

FIG. 3.

When the physician operates, while he himself is insulated, which is preferable in a great number of cases, the form of the excitator ought to be

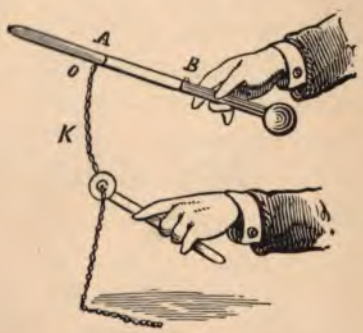

FIG. 4.

modified. The middle of the rod (Fig. 4), *i. e.*, the part AB, is of glass, and upon its two extremities, at A and B, are soldered the metallic parts.

Beyond, near the points A and B, at O, is found a little hook, to which is attached the chain K, which connects the excitator with the ground. The metal of this chain ought to be of the same nature as that of the excitator.

The chain K, is seen to pass through the ring at the end of the glass rod, held in the left hand of the operator. This little instrument has no other object than to keep the chain from the side of the insulator, for contact would prevent all phenomena.

ELECTRIC BATH.

By this term is meant a purely *fluidique* bath, and not a liquid bath, such as is in usage in Dynamic Electricity. The Voltaic bath is simply an ordinary bath, the water of which is in communication with one of the rheophores of an induction apparatus, or of a powerful pile, while the other rheophore is applied upon some part of the body above the water, the shoulders, for instance. This bath, to which from the first, has been attributed a certain efficacy, does not possess, as has been since discovered, any curative virtue.

In our fluidique bath, the patient is dressed, seated upon the insulator, is put in communication with the machine by means of a metallic tube (Figs. 2 and 5). As soon as the wheel is put in motion the patient feels that he is inundated with the fluid (electric) from head to foot; he is plunged in the electric fluid as a fish is in water. The hair is disturbed, the respiration becomes more free, and an agreeable sensation pervades the whole body.

All physicians who have studied Static Electricity, have observed that the fluidique bath induces an acceleration of the pulse. Moreover, it enjoys important peculiarities: it is singularly calmant, eases the respiration, develops animal heat, augments cutaneous transpiration, makes more active the urinary secretion, disperses nervous irritations, gives tone to the whole organism, increases the vital forces, and augments the energy of absorption. In a word, it excites and facilitates the play of all the functions. The well-being which it instantaneously procures, causes those who have once experienced it to wish for a repetition of its beneficent effects.

The fluidique bath is a curative means, very efficacious and at the same time very mild. It is by this that we always commence the treatment of a patient, whatever his trouble may be, by administering, for a few days, the fluidique bath, before passing on to more active means; and in proceeding thus, with prudence, we need never fear the least inconvenience. "The electric bath," says Mauduyt, "serves to sound, as it were, the temperaments of patients, and to lead to avoiding every accident."

Electricity augments animal heat. This fact has been put beyond a doubt by the experiments of Jellabert, Sigand de Lafond, Franklin, etc., who have seen the mercury rise several degrees in thermometers placed in the axillæ, during Electrization. Every one, without exception, acknowledges an augmentation of heat at the end of each sitting; in some is produced a moderate degree of sweating, while in others most copious sweatings supervened. For this reason, patients ought never to expose themselves to the air immediately after an electrization, but should delay going out at least ten minutes.

we are happy to be in accord with him once; it is when he speaks of the danger of producing violent commotions (in the body) from repeated discharges of the Leyden Jar. We partake of the fears of Doctor Duchenne. But he will allow us to tell him that it is a long time since the use of shocks from the Leyden Jar were used. In 1819, a distinguished Paris physician, Doctor Pascalis, who used Static Electricity with great success, said, "It is known that simple electrization by baths, brush, and sparks answer much better to the medical views demanded, than more violent shocks." *

For our part, it is scarcely necessary to say that we have always expressly condemned the use of the Leyden Jar.

Singularly enough, after having so disdainfully banished Static Electricity from therapeutics, Doctor Duchenne says, "It is assuredly incontestable that Static Electricity which, for so many years was used exclusively in practical medicine, has

* "Memoir on Electricity." By Dr. Pascalis. 1819.

accomplished cures, bordering, in appearance, on the marvelous." *

Farther along, as if this general avowal was insufficient, he says, "Static Electricity has cured chorea or St. Guy's dance, and a large number of nervous and paralytic affections." †

What do we think of these contradictions?

Happily, all the physicians who make use of Dynamic Electricity are not so severe on Static Electricity as Doctor Duchenne! In his learned work,‡ Doctor Tripier, who daily used Dynamic Electricity, says "Static Electricity offers resources too much neglected in our day." A few pages farther on, in speaking of the operative procedures, he says "These procedures are well nigh completely abandoned; there is in it (Static Electricity), however, such as the electric bath, the electrization by needles, the souffle, that which cannot be supplied by any equivalent procedure, and before being banished from therapeutics, an ex-

* "On Localized Electrization," page 7.

† Ibid. Pages 204 and 211.

‡ "Manual of Electro-Therapy." By Doctor Tripier. 1861.

perimental study should be again entered into, to learn its effects." Here is certainly scientific language, which consoles for certain sharp and erroneous affirmations.

How ought communication to be established between the patient and the machine?

All physicians who have preceded us have established this communication by means of a metallic spiral, terminating in a ring, held in the hand of the patient. After having used successively the spiral and the tube, we give decided preference to the latter. It offers a considerable more surface, and, the quantity of electricity being in direct proportion to the surfaces, an abundance of electricity thus reaches the patient. We should see to it well that the tube is very smooth, so that no escape can possibly take place into the atmosphere, by any roughness whatever. It ought, moreover, to be encased in a glass tube, especially in wet weather. Lastly, it should always be of the same nature as the excitator and the conductor of the machine.

Whether the spiral or the tube be used, it is

very important to determine exactly the part of the body which should be directly in communication with the machine.

Experience has demonstrated that the electric current ought always to be directed from the origin to the termination of the nerves; from the head, or the spinal cord, to the extremities. Now let it be understood that, in placing the ring in communication with the hand of the patient, we give to the current a direction wholly opposite to that which it ought to have; that is to say, it is made to pass from the termination of the nerves towards the nervous centers, when this is contrary to what it should be. Consequently, we have two opposite currents — the current from the machine, and that from the excitator.

We should endeavor to make them act in the same way, and this is the way we proceed: We substitute for the terminal ring a small plate of the same metal as the tube, about five centimetres long, by three wide. This plate, instead of being held in the hand, is placed upon the nucha, on a level with the upper cervical vertebra (Figs. 2 and 5).

The current thus reaches, directly, the nervous centers, and passes thoroughly over the nerves from their origin to their termination. The current from the machine, and that from the excitator, consequently act in the same way.

ABSORPTION OF ELECTRICITY BY THE HUMAN BODY.

Before proceeding to detail the method of administering Static Electricity to patients, it is important to say a word of the manner in which it penetrates our organisms.

The body of man absorbs, sucks up, as it were, the electric fluid through all its pores, which open upon its surface. These pores, through which passes the product of cutaneous transpiration, are, in truth, very small; but the molecules of which the electric material is composed have the least imaginable diameter. "They have," says Bertholon, "a tenuity, at the least, equal to that of the atoms of light itself, a fluid the subtilty of which is beyond all imagination. Moreover, these pores afford a very easy entrance to more dense bodies, as mercury,

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and, in general, all pharmaceutical preparations." It is through the pores that the electric fluid is transmitted to the depth of the various organs and the more delicate organic structures. It is in this way also that the infinitely small particles, which escape from the excitators and to which Electricity serves as a vehicle, are carried into our organisms.

The pores of the surface of the body are not the only channel which allow Electricity to penetrate our economy. It also has the lungs, which, with each inspiration, receive either the simple electric fluid, like that obtained in the electric bath, producing around the patient an electric atmosphere which penetrates the lungs as ordinary air; or (receive) the medicated electric fluid as when the point of the excitator is directed to (into) the open mouth. The electric fluid, charged or not with medicated principles, reaches, the same time as the air, the bronchial vesicles, to pass into the vascular system and commingle with the blood and thus to circulate throughout the whole body.

By this operation the patient perceives a taste

of metal very pronounced, which is wholly according to the excitator. As to his expiration, it has a metallic odor so strong that persons around him can perceive it at a great distance.

Every one will be impressed as we were by the powerful and novel auxiliary afforded by the electric current. All physicians resort almost exclusively to the stomach as the agent of transmission, in the organism, of chosen medicaments. Whether the dose be infinitesimal or large it is always addressed to it (the stomach). We thus fatigue deplorably the essential organ of life, the marvellous crucible wherein the great phenomenon of digestion takes place, and soon worn out, it functionates only imperfectly and becomes the seat of those affections which have upon the whole economy an effect so fatal.

This imperious necessity of sparing as much as possible the stomach, has imposed itself for a long time upon science; numbers of physicians have sought for other means of absorption. In thoracic troubles, for example, instead of confining medicine to the stomach it is generally agreed

to carry them directly to the laryngeal and bronchial mucous membrane by the aid of pulverizations.

The skin is also often used, since more than one celebrated specialist can affirm, that, very often, in syphilitic affections, he has obtained much better results in using mercurial inunctions than in administering mercury by the stomach, as is generally done.

Static Electricity utilizes at once the principal means of absorption, the stomach, the skin and the bronchi.

ELECTRIC CURRENTS.

To produce a very perceptible electric current it is sufficient to bring near to the patient, seated on the insulator, the point of the excitator held at a few centimetres distant. (Figs. 2 and 5.)

The patient then experiences the sensation of a breeze, cool or lukewarm according to the nature of the excitator and according as the organ, to which the current is directed, is sound or diseased.

If the excitator, instead of terminating in a sin-

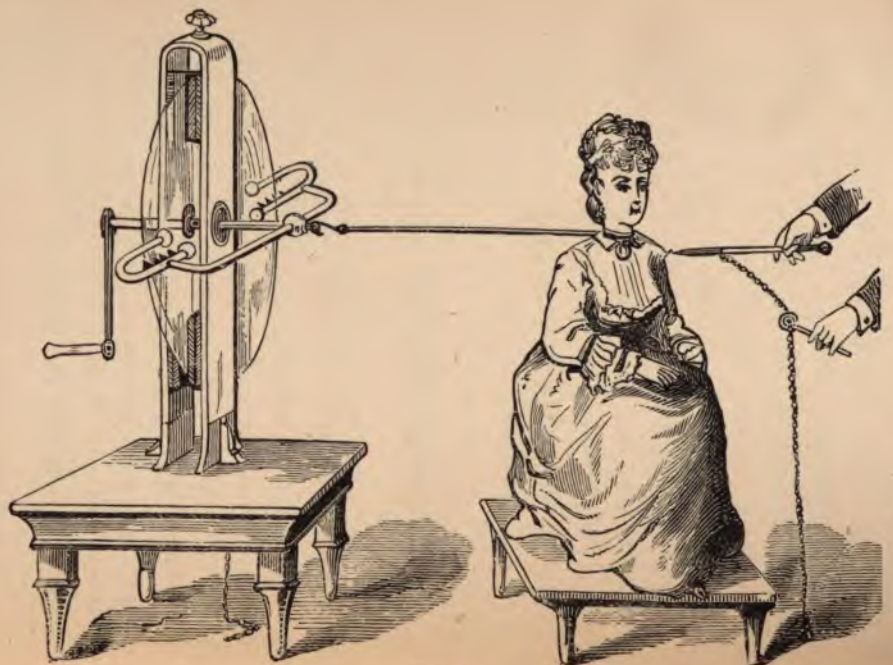

FIG. 5.

gle point is terminated by a metallic plate, upon which is implanted a greater or less number of points we obtain a current much more soft to which the name "Electric Souffle" has been given. First and foremost, it will be thought that the more points there are the stronger the current ought to be: it is quite the contrary because the force of the current is divided into as many parts as there

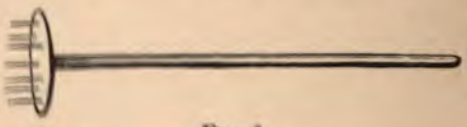

FIG. 6.

are points, and the action of each is enfeebled by that the neighboring ones exercise upon it. Besides its mildness, this instrument offers another advantage, in that it occupies a larger space and embraces at the same time a whole region.

Let us say once for all, that the currents, as frictions and sparks, ought always to be directed from above downwards, and always, also, in the exact direction of the nerves and the diseased muscles.

SPARKS AND ELECTRICAL FRICTIONS.

If, instead of the point, we bring near to the patient the round part of the excitator, we obtain a spark more or less strong, according to the distance, but always without shock. The excitator is then removed in order to give to the conductor and the patient time to become recharged with the fluid, and in approaching the bulb (of the excitator) a new spark is obtained.

The sparks induce slightly the sense of stinging, of heat and of contraction of the muscles, electrized. They agree especially in cases of paralysis, of feebleness, of atony, of numbness, and act as a dissolvant of certain engorgements and of certain tumors.

If we cover with flannel a part of the body in such a way that the flannel is applied so exactly as not to form a single wrinkle, and then gently bring to this part so covered the bulb of the excitator, we experience a gentle heat and a prickling resulting from a multitude of small sparks which flash between the flannel and the bulb of the exci-

tator. This method of Electrization is called *electric friction*, and gives, in many cases, the best results. Manduyt, who has often made use of this means, has by it secured very good effects. It is to Dr. Masars de Cazales that we are indebted for this excellent procedure. Instead of covering the diseased parts we can lay them bare and develop with flannel the bulb of the excitator. This procedure is even superior in some cases to the preceding, because it allows us the better to follow the course of the nerves and muscles.

We cannot too often repeat that, in order to obtain a strong friction, the external clothing should be of woolen or of silk. Cotton and linen being too good conductors do not allow the convenient practicing of this operation.

When we wish to subject to the influence of the electric current certain cavities, as the mouth, the ear, etc., it is sufficient to present to the opening the point of the excitator. But if it is necessary to have recourse to sparks and to penetrate deeply, this is the method of procedure: We take a glass tube, very thick, and varnished with shellac, with

a small metallic rod passing through it, the two extremities of which projecting beyond the tube are terminated by bulbs. When, as represented in the figure, we wish to electrize the ear in a case of deafness; the patient seated upon the insula-

FIG. 7.

tor, takes in his hand the glass tube and pushes one of the bulbs deeply into the ear, while the operator, by the aid of the ordinary excitator, causes a spark to flash from the other bulb. This spark is immediately reproduced at the other extremity, that is to say, between the bulb introduced into the ear and the portion of the ear to

which it corresponds. This latter bulb should be very small so as to penetrate as far as possible and reach very nearly to the tympanic membrane.

All the operations which precede, and all those which follow, are to be practiced, as we have said, while the patient is upon the insulator and the physician upon the ground (or floor). In certain cases it is preferable to reverse these positions, *i.e.*, to have the physician upon the insulator and the patient on the ground (or floor). The electric fluid which he receives seems more gentle to him, and certain authors, among them Cavello,* a celebrated English physician, give preference to this procedure, and aver that they have by this means obtained the greatest advantages.

There are some cases where this is the only procedure that can be used; it is when the patient is in bed and it is impossible for him to leave it. The physician then mounts the insulator and electrizes the patient in bed.

It is true that we can insulate the bed by means of glass feet, but this is too long and inconvenient.

*"Complete treatise on Electricity." By Cavello. 1785.

ELECTRIC DOUCHES. — PULVERIZATIONS.

In certain affections, generally those affecting the organ of vision, as conjunctivitis, blepharophthalmia, etc., appropriate collyria are of great efficacy. We have many a time confirmed that if, to the peculiar properties of a collyrium, the action

FIG. 8.

of Electricity be added, we obtain a much more rapid cure. To practice this little operation we make use of a hollow glass excitator, the extremity of which terminating in a point, is provided with a capillary opening, traversed by a wire of platinum, the least oxydizable of the metals. The aperture is thus almost completely closed. The collyrium is turned into this apparatus, the extrem-

ity of which is presented before the diseased part. We immediately see formed by the action of the electric current a liquid spray, flowing (passing) in the form of extremely fine sprinkling, which constitutes a veritable electric douche. (Fig. 8.)

In certain affections which will be spoken of farther on, we have very frequently employed with advantage the pulverization of a medicated solution administered by the aid of a pulverizator to the diseased part made bare, while the patient is in communication with the machine.

NATURAL ELECTRICAL CURRENTS.— FRICTIONS.— SHAMPOOING.

Electric friction, we have seen, is determined by the bulb of the excitator directed upon different parts of the body. We can obtain the same phenomenon by using the hand alone. In these cases the operator places his hands lightly upon various parts of the body of the subject seated on the insulator. Both experience tingling, which are not at all painful either to the one or to the other.

If it take place, or if the patient is too irritable, the hand of the operator acts at a distance and frictions are replaced by currents analagous to those produced by the metallic points, but stronger than they are. The currents, which we may call *natural electrical currents*, since they are produced directly by the hands and without the aid of the intervention of any instrument possess quieting properties very pronounced. By their use we have many a time quieted pains most violent and rebellious, and among others the shooting, atrocious pains peculiar to *progressive locomotor ataxia*.

Finally, another operation can be made, yet more directly, with the hands upon the electrized patient—this is the shampooing, practised as the ordinary shampooing, with this difference, that it is not always necessary to remove the clothing.

EXAMINATION OF THE PATIENT.

We invite the attention of all our *confrères* to the two following axioms:

1st. Whenever a man is suffering, the electric fluid ceases to pass uniformly in his organism ;

2d. Electricity from the machine is always without effect or is sensibly modified by the place or seat of any disease whatever.

It is unnecessary to insist upon the physician understanding, by this aid, what an assistance he has in establishing a diagnosis. In a crowd of latent diseases, of equivocal seat, electricity accurately points out the organ affected, and the practitioner has only to demand of science the malady which affects the patient.

Of all the regions of the body the vertebral column is the one where the trouble in the electric currents shows itself in the most sensible manner. Before proceeding, it is necessary to examine the way in which it is affected by Electricity.

With the electric bath, nothing is easier. While the patient is in communication with the machine, the physician gently brings near to the different parts of the body the bulb of the metallic excitator, and observes attentively the places which remain insensible, rebellious to all excitation.

Dr. Beckensteiner* ordinarily uses his hand in this exploratory operation. He carries it along the back, from the upper cervical vertebræ to the sacrum, mildly and lightly. By this contact the physician and patient both perceive the slightest prickling in the sound parts and none at all in the diseased parts. In this case the hand produces the same effect as the bulb of the excitator, but its action is perhaps more delicate

Let us cite only two examples, in order the better to comprehend the importance of the part played by Electricity in establishing a diagnosis. In progressive locomotor ataxia it is in vain that the operator solicits vibrations in all the inferior part of the vertebral column. And in pulmonary phthisis not only will insensibility of certain points of the spine be constant, but a sensation of heat, very marked, will point out the region of the chest the most directly affected.

Physicians of the last century nearly always insulated themselves when administering Electricity. However, they understood the method of non-

* "Practical Electricity," 2 vols., by Dr. Beckensteiner. 1859.

insulation and of using it sometimes. To cite only one case:—Bertholon relates that he caused an alopecia to be cured, which was induced by a long and grave sickness, by directing upon the head of the subject currents produced solely with the hand.

As to ourselves, we think that it is much better that the physician be isolated, and wholly without the circle of action. In this way the Electricity which reaches the patient is more direct, more pure, and ought, consequently, to produce the best results, as we have many a time proven, having often made comparison of the two methods.

We have exhibited in this chapter the different methods of using Static Electricity in the treatment of diseases. We will detail farther on procedures applicable to this or that case. We only wish now to well establish what we have many times hinted at before, that it must be used, if we desire to succeed, with the greatest prudence, and never to pass to a stronger use of it when we perceive

that a feebler one suffices. It is always bad to have recourse to a vigorous treatment when a mild one answers our purpose. We cannot do better than to reproduce the law laid down by Manduyt.*

"If Electricity is a remedy, it should, like all other remedial agents, be administered in a degree proportional to the necessities of the case, to the temperament, to the constitution of the patient to be electrized; without which we run a risk, either of using the Electricity to a degree too feeble to have any action upon the disease, or of using it to a degree so violent as to excite in the animal economy a new trouble, in addition to the one already existing."

It is now well to repeat here an observation, made by Dr. Thillaye,† of great importance, and which ought always to be present in the minds of physicians who use our method:

"It generally seems that the more we commence

* "Memoirs upon the different Manners of Electrization." 1778.

† "Essay upon the Medical Employment of Electricity and Galvanism." By Dr. Thillaye. 1803.

to administer Electricity with force, the quicker do we reach a state of amelioration to which we can add no more. While in advancing more slowly we have the benefit of approaching a cure more slowly and often even of accomplishing it."

Finally, let us say that all physicians who successfully use Static Electricity agree in asserting that we must continue the use of it a long time in order to obtain a complete cure.

When the disease is recent it disappears rapidly, but in combating chronic affections, against which all things have been uselessly employed, it takes a long time and firm perseverance. Often have we seen patients who, for a considerable length of time—two, three, and even four months—apparently resisting our treatment, finally yield and become quickly cured. However it is with electricity as with many other remedies, which in chronic affections show their effects only with time. Besides, it is not to be forgotten, that patients do not demand the aid of Electricity until after having tried, without a single benefit, all the

resources of other treatments,—a condition very disadvatageous to a speedy cure.

All these considerations should engage the attention of the patient as well as that of the physician, so as not to discourage too promptly, as has frequently happened, to the one and to the other.

IV.

ON THE TRANSPORT OF MEDICINES BY STATIC ELECTRICITY.

Electricity, as we said in the preceding chapter, carries with it the molecules of substances which it traverses to transmit them to the patient, whom we are thus able to cause to absorb by the skin and the lungs all utilizable agents in medicine.

This phenomenon, as is easily comprehended, is of extreme importance and discovers to the healing art a horizon wholly new. It is necessarily indispensable to establish this by certain indubitable proofs.

Physicians of the 18th century who applied static electricity to the cure of diseases were not slow to note that the intensity and action of the current varied with the nature of the excitator. Thus they used excitators of different materials,

according to the affection which they wished to combat.

M. Privati, of Venice, is the first to point out the carrying of medicines by means of Electricity. His experiments date back to 1747. He verified the action of certain remedies on the system which were held in the hand by the patient as he was electrized. He claims to have purged many persons while they held during electrization purgative substances. Unfortunately he exaggerates the value of this fact (process) and falls into the error of maintaining that odoriferous bodies sealed in hermetically tight tubes of glass and electrized by friction diffuse their odor by traversing the pores of the glass, and produce the same effects as though administered internally. Privati claims to have secured by this means rapid cures of diseases of long standing; but we are forced to conclude that these cases ought to be accredited solely to the action of electricity; glass being a non-conductor of Electricity can not conduct electricity to other bodies, as it can be conducted to it by friction. Privati experimented under unfavor-

able auspices, with defective apparatus, and the results which he claims to have attained do not merit ordinary confidence. But it is nevertheless true that he is the first who showed the important phenomena of transport.

Medical electricity has daily, since the experiments of Privati, undergone improvements, and the physicians who came after him used as excitators substances which varied with the disease they desired to cure.

So Manduyt proved that, in the treatment of amaurosis, the currents generated with a wooden point succeeded better than those obtained by the aid of a metallic point.

But it is only within recent years that transport has been established upon well-grounded, mathematical proof, so to speak.

M. Becquerel (Treatise on Electricity and Magnetism, 1835) expresses himself thus in the chapter where he treats of the *transport of ponderable substances by electric discharges:*

"When the electric current traverses metallic wires, and if the tension be sufficient, it melts,

volatilizes and eventually disperses them: but how is this phenomena accomplished? Are the ponderable particles carried by virtue of the reciprocal affinity between them and Electricity? Observations, made by M. Fusinieri, will some day settle this question.

"This physician has observed that a spark which traverses the air, in passing from a conductor of brass, carries with it some brass in a state of fusion and some incandescent particles of zinc. When it leaves a knob of silver it bears with it some silver in a state of fusion: but if it traverses a plate of copper, the silver is carried through that metal, which it perforates to the thickness of many centimetres, if the passage from one surface to the other be effected obliquely; one portion of the silver then remains imprisoned in the opening which it has made in the copper and the other portion penetrates the body of the excitator placed at the other side.

"Gold transported by the spark behaves in the same way with reference to silver wire which it traverses. One part of the gold remains in the

silver and spreads itself upon both surfaces, in the form of round flakes, so very thin that they disappear in a short time.

"In these transports there is a reciprocity of action; that is to say, that if the spark flashes forth between the silver and the copper, there is a transport of silver to the copper and of copper to the silver. When the spark leaves a metal and passes into the air it carries with it a group of molecules.

"According to M. Fusinieri, the electrical principle is endowed with a spontaneous expansive force, of which one sees instances in the manner in which brass and gold are disseminated on the polished surface of silver. These metals are deposited in excessively thin flakes, which disappear by volatilization."

Priestly had already observed effects of this nature, in the same manner as the phenomena of transport; but instead of employing the simple spark, as Fusinieri did, he used an electric battery and obtained similar phenomena, but much more pronounced.

"The first time," said M. Becquerel, "that Priestly used an electric battery, that great physician observed that with each discharge he produced a very black dust, arising from the metal, although the metal wire was not melted and the chain which he used was very large.

"He furthermore observed that a sheet of paper on which the chain had lain was marked by a black streak, all along where the chain laid, and that the latter had lost a very minute part of its weight.

"To reassure himself of the effect of dispersion, Priestly caused a discharge to traverse a piece of charcoal. The carbon was reduced to powder; the cardboard upon which it was placed was torn, and the carbon penetrated the interior.

"Having placed the chain on a plate of glass, he so placed it during the discharge as to make spots of an agreeable aspect, of the width and color of each link. The metal at the exterior (outer) part of these marks could be easily detached from the glass, while in the middle part it was made a body with the glass." (Was *into* the glass.)

All these experiments, as M. Becquerel remarked in closing, show conclusively the phenomena of transport.

We owe to M. Beckensteiner and to M. Parisal, chemist, of Lyons, an experiment no less conclusive than the foregoing, and that was made the first time by these two *savans* in 1838.

A person seated on the insulator, in communication with an electrical machine in motion, held in the hollow of his hand some starch, dissolved in a little water. In exciting sparks upon the starch with a bit of iodine, small blue spots could be immediately seen wherever the sparks flashed. In order to make these spots appear, there must necessarily be a transport of the molecules of iodine, which, with the starch, formed the iodide of starch, whose color, every one knows, is a beautiful blue.

Some more of the very certain proofs follow.

1st. From the different sensation which Electricity gives according to the metals which serve as conductors. This difference is explainable *only* by transport, without which the sensation would be the same with all metals.

2d. The very odor of the current, which varies with the substance of the excitator to such a degree that at the end of a few sittings it is easy for the patient to distinguish the nature of the metal used, merely by the odor of the electric fluid.

3d. From the variety of the therapeutic results. The results ought certainly to be always identical, whatever the nature of the excitator. Now, it is not so at all. Thus, afterpains rapidly disappear by the currents and a slight friction of copper (red), while one seeks in vain with all other metals to attain a like result.

4th. From the loss, very appreciable, in weight, sustained by the metallic excitators by daily use.

5th. Finally, from an observation wholly personal, and what we owe to chance. We have excitators of pure gold and others of silver, plated. The film of gold which coats these latter is tolerably thick, and at both ends — that is, on the bulb and on the point — it is at least double that on the rod (shank), which the operator holds in his hand.

If there be no transport, the gold ought not to

disappear from the extremities, which never touch either the patient or an object. It should, on the contrary, leave the rod, on which the film (plating) is less thick, and which the doctor always holds in his open hand. We observe quite to the contrary. At the end of twenty or thirty days the gold disappears from the bulb and point and shows

Fig. 9.

the silver, while the rod remains intact, although subjected to continual handling, and the gold film which covers it is half as thick as that upon the extremities. Nearly every month we are obliged regild the bulb and point of the instrument.

After these proofs which we have produced, no one will be able to deny transport. But will not some one object that the quantity of medicine transported is very small? True, it is *extremely small;* but the agent which serves (to it) as a vehicle, the electric fluid which transports it, is so

strong, so energetic, so penetrating, that this small dose, in a particular state, acquires a great power, and suffices in most cases to secure a cure.

Nevertheless, if the doctor find that it is not sufficient, he has but to prescribe, internally, medicines which he deems suitable, remembering the recommendations which we will make regarding the doses when we shall treat of this point in the chapter ensuing.

V.

MEDICINES.

We saw in the previous chapter what physicians of the last century knew of the phenomena of transport, which plays such a prominent part in the method which we advocate.

They knew also that the therapeutical effects of Static Electricity differed according to the metal used to produce the current, the friction and the spark.

Not only had they studied the electrical action of metals on the system, but they knew equally well that of the vegetables. In his memoir upon the different ways of administering Electricity, Manduyt establishes, in effect, that to cure or ameliorate blindness, amaurosis and many other affections of vision, he should make use of currents produced by a wooden point, and not of one of metal.

Transport being a fact well proven, well established, practitioners naturally enough considered that medicines passed directly into the organism by Electricity. Privati, of Venice, we have seen, in the preceding chapter, affirmed that he had purged patients on their holding in their hands purgative substances. His experiences were contestable, but the idea was true and suggestive.

Father Beccaria having volatilized mercury by the help of the electric spark, Gardini conceived the idea of applying to scrofulous tumors a plate of lead amalgamated with mercury and afterwards to excite sparks. "The electric fluid," says Bertholon, who reports this fact, "in penetrating the human body bears with it the particles of volatilized mercury by this process, and becomes by this operation more active and more fit to disperse and to cure these tumors: furthermore has he obtained by this method great success."

"I advised," says Bertholon further, "a surgeon to use this method on syphilitic virus. The treatment is perfectly sure of its aim, and it seems to have been crowned with success."

M. Beckensteiner, a skillful physician of Lyons, followed the same course as his predecessors, and developed facts which they had not even outlined. Proceeding upon analogy, he made excitators of different materials, and when he had an anemia to treat, for example, he made use of an excitator of iron, a metal which medical men use with every success in this affection.

After having used this system several months, we were not slow to notice that Bertholon, Ligaud de la Fond, Manduyt, Cavello, M. Beckensteiner, and indeed all our predecessors, had made crooked progress. The imperfection of their method has most assuredly improved the popularization of Static Electricity, and has been the cause of the unmerited oblivion into which it has fallen.

It is evident, *a priori*, that a medicine given in very small doses in suspension in water and by the usual way, the stomach, ought to produce an effect wholly different from the same medicine in infinitesimal doses but introduced by a fluid most energetic, the most subtle that exists. Who can say in what state the remedy is transported by the

electric fluid at the moment it arrives in the economy? Ought it not to be changed in its nature, in its composition, in its very essence, and therefore, also, ought not the effects which it produces to be wholly different? It is now a well-established fact that all medicines which penetrate the human body by the aid of electricity cannot act in the same manner as though they were administered by the stomach.

Consequently, electrical therapy, such as has been practiced to the present day, rests on hypotheses, or rather on analogies, which nothing justifies.

In support of our assertion we may be able to cite a great many proofs. We content ourselves in producing one of them which sufficiently illuminates the question.

In medicine, one oftentimes uses with success, in the neuroses, certain preparations of silver. In accordance with this fact, which is far from being always true, M. Beckensteiner thought that preparations of silver administered electrically ought invariably to be right for nervous troubles and

rheumatism, and were indicated in all cases where a calmative is necessary to control pain.

After having for several months made use of medical applications of Static Electricity, one fact was suddenly demonstrated to us, in an evident manner, how far this belief is to be hazarded. One of our patients had suffered many years from rheumatic pains in his lower extremities. The principal seat of pain was in the muscles on the anterior part of the thigh. According to the ideas admitted thus far, this case demanded most certainly the use of silver. We used, for a month, this metal in currents, in frictions, and in sparks, and, to our great astonishment, we did not get the least amelioration. We began to be hopeless, when one day the patient told us he suffered much less in the thighs, but that, on the contrary, he experienced in the abdominal region intolerable sufferings. This was not the first time this phenomenon was produced; suddenly and without cause the pains left the thighs and went to the abdomen. Well convinced that the pain in the belly was of the same nature as that in the

thighs, we were of the idea of abandoning the silver, which yielded us no success, and of employing red copper. By the aid of an excitor of this metal, we practiced for ten minutes the currents and the frictions upon the abdomen. At the end of this short sitting the pain had disappeared, but on the day following the thighs had again become painful. Struck with the result that we had obtained the day before, we electrized the thighs for several days with copper. After many sittings, a notable improvement showed itself and became more pronounced every day. Red copper was the medicine which was suitable to this patient: it was certainly the electric quieter which aided these pains.

We could, if it were necessary, multiply our examples; but does not the fact that we have just recorded amply prove that electro-therapy has been developed within a few months?

The reader will judge by what follows if this immense work is completed up to to-day.

Far be from us the thought of denying the cures of neurosis which M. Beckensteiner claims to

have obtained by the aid of silver. We ourselves have cured many nervous affections by the use of this metal. But these patients have what Dr. Burq calls an idiosyncrasy for silver, the same as M. N. had an idiosyncrasy for red copper.

From what precedes, it is evident that in electro-therapy there is nothing specific. The calmant which succeeds with this one may fail with that one. The phenomenon which is a tonic to this one is without action upon another. The remedy, then, must be sought out which is not only adaptable to each disease but to each patient. This problem, we should know, is difficult and slow to solve. It is evident that by multiplied experiences and gropings without number, that is to say, in trying for some time each one of the known medicaments, we will be able, in noting the effect of each of them, to discover the one which ought to succeed in every given case. But to what a length this experimentation would be prolonged! and for the most part the patient would be discouraged before he would be cured.

We were at this point when the *brochure* of Dr.

Burq happily fell into our hand. We knew of his works on cholera for a long time, but were ignorant of the existence of his work on the application of metals to nervous diseases. (Métallo-thérapic Treatment of Nervous Diseases. Dr. Burq, 1871.) This learned *confrere* was very willing to show us all the subtleties of this method, and we conveyed to him our own experiences.

We are far, let it always be said, from partaking of all the ideas of the author of Métallo-thérapeutics. But it is incontestable that physiological facts produced in a few moments by the application of metals to persons tainted with nervous diseases enables us to determine, almost always, the remedy which, given electrically, and administered, sometimes, at the same time internally, is applicable to each patient; for, be it repeated for the last time, the same remedy is far from curing all those who suffer from the same disease. Otherwise it is the same as in ordinary medicine. Belladonna, for instance, quiets facial neuralgia of this one, and is without the least efficacy in facial neuralgia in that one. It is because each patient,

by his constitution, by his temperament, possesses a particular idiosyncracy for each medicine.

Let us give a short analysis of Dr. Burq's system, which we have added to our system, in order to determine, in operating as we direct, the agent which should be used as excitators in each case which may be presented to us.

First of all, it is necessary to define what is meant by the word "idiosyncrasy," which comes so often from our pen. We can not do better than to give the definition which is found in Nysten :—

"Idiosyncrasy is a disposition which gives to each individual a particular susceptibility, a manner peculiar to him, to be influenced by divers agents capable of impressing in a certain manner some one of our organs."

It is to find out the idiosyncracy, *i.e.*, this therapeutic susceptibility, peculiar to each individual, that Dr. Burq has wrought out the ingenious experiments of which we are about to speak.

In most nervous troubles that one meets with there is nearly always a diminution or even an

abolition of the sensibility of the skin. This diminution of cutaneous susceptibility has to be denominated *anæsthesia* or *analgesia*.

On the same side with anæsthesia is noticed *Amyosthenia* of the muscles, *i.e.* a diminution of myotility or muscular contractility.

This being established, and a nervous malady being given, we next proceed to decide upon the metal which advantageously influences the organism of the patient:—

1st. By the aid of a thermometer placed in each hand we determine the temperature of the right and left, and note the figure obtained for each side.

2d. With a dynamometer we measure the muscular force on the right and left sides.

With a healthy man, of average size, the muscular force of the right side should vary from 48 to 55 kilogrammes. On the left side it ought normally to be about one-fifth less. When this relation between the left and right side exists there is said to be a harmony between the two sides.

With the female, the muscular pressure with the right hand varies between 30 and 40 kilogrammes; that of the left hand should be, as with the male, about one-fifth less.

3d. By the aid of the esthesiometer we examine on each forearm the state of the sensibility by contact. When it is normal the patient should have sensation from the two points, separated only three or four centimetres, five at the most. It sometimes turns out that sensibility to contact on one side is normal and abnormal on the other.

4th. By the aid of the needle we seek to know upon each forearm the state of sensibility to pain.

5th. Lastly, we determine, on the same places, the state of the capillary circulation, *i.e.*, we observe if the punctures made by the needle leave a running of a little blood or remain free from blood.

These different operations can be practiced on the external region of the forearm, because these parts are easily accessible and are likewise the privileged seat of anæsthesia and amyosthenia.

All the preceding observations being well noted, we then begin the metallic applications. For

greater clearness we are going to take two examples, and compare gold and silver in any one nervous disease whatever. In the right hand we place a hollow cylinder of gold, and around the forearm (right) we put a bracelet of the same metal. We put in the left hand a cylinder of silver, and around the forearm a bracelet also of silver.

Finally, in the interior of each cylinder that the patient holds in his open hands, we put a thermometer.

At the end of ten or fifteen minutes we prove that:—

1st. On the left the temperature has not changed; it is always the same as before the application of the silver. While on the right, where the gold is, it is raised one degree higher than it was. The elevation of the temperature is in consequence of the use of the gold.

We then remove the cylinders and bracelets which remained in place during fifteen or twenty minutes, and we repeat the preliminary experiences.

2d. By the aid of the dynamometer we see that the muscular force remains the same on the left side, but that it is augmented by one or more kilogrammes upon the right. This augmentation is again in favor of the gold.

3d. By the æsthesiometer we ascertain that, on the left side it still takes considerable division of the two branches that the patient may still be sensible of two points. While on the right, he feels the two at a less distance than before the metallic application. This amelioration of the sensibility to contact speaks still in favor of the gold.

4th. By the aid of the needle we ascertain that the insensibility to the puncture still remains on the left. On the contrary, the puncture becomes more or less painful on the right. This return of the sensibility to pain pleads still the cause of gold.

5th. Lastly, the punctures remain bloodless on the left, while those on the right give one or more globules of blood. Another sign in favor of the gold!

All the changes obtained on the right allow us to say, then, that, of the two metals tried, silver ought to be rejected, if not as harmful, at least as absolutely useless in the case given.

Is this saying that gold will agree? Assuredly not. It must then be compared with another metal—platinum, for example. And in thus trying all metals, we arrive, by comparison and elimination, at discovering the agent which influences the organism more than all the other metals; that is, the one which it is proper to use as an excitator, and with it we will practice on the patient the various operations which we detailed.

But we have shown that the properties of the whole substance are modified by the electric fluid which transports it and causes it to penetrate the system by the pores of the skin and by the bronchi. Consequently it might not be surprising to obtain no good effect from an excitator the nature of which would have to be in the meantime determined by delicate experiments, which we are now going to describe. We have sought the means to evade failure, which menaced us, and we have

been fortunate enough to discover it. It consists simply in making the metallic applications and all the experiments in an *electric atmosphere*, that is to say, when the patient is on the insulasor and in communication with the machine. In proceeding thus, we will decide upon, with exactitude, the excitator, the material of which will be pointed out by the modifications which it will produce, in an electric atmosphere, upon the temperature, muscular force, sensibility to contact, sensitiveness to pain and the capillary circulation.

Before commencing electrical treatment, no matter what the nervous affection, it must be previously determined what the nature of the excitator is of which we should make use, in order to produce either the current, the friction or the spark. These experiments, we admit, are a little long, but in the actual state of Static Electro-therepy, they are indispensible in order to surely obtain a cure. Nevertheless they do not prolong the duration of the cure, since they manifest themselves while the patient takes a bath, which we ought always to administer the first three or four days of the treatment.

A day will come wherein observations will be so numerous, so varied, so well classed after the nature of the disease, the constitution of the subject, etc., that each case which presents itself will be immediately classed in such category that we will always know what medicine is requisite. From this day forward, all physicians who use our method should set to work and carefully classify all the cases they treat; those who follow after us will only have to profit by the observations which we will bequeath to them.

Dr. Burq studied only the action of metals and, as he says, he left to others to continue the works which he began. We ought in reality to go farther and study the vegetables which furnish to medicine so many and such precious medicaments.

The study of vegetables seems as easy to us as that of the metals. From those which have large stalks and large roots we cut out cylinders and washers (bracelets), and operate with them precisely as we work with cylinders and washers of metal.

If the plant have only stalks and roots very

small, we reduce them to a coarse powder and mix it with a little water to form a thick paste, that can be applied around the forearm and held in the hand. We do the same when we wish to make trials with the leaves and flowers of any plant whatever.

Static Electro-therapy thus utilizes not only all metals but also all vegetables.

When a plant is designated to be used electrically in the treatment of any nervous trouble, nothing is easier than to administer it.

If the stalk or root be large enough we make excitators of it which are used as metallic excitators. We have thus excitators from a large number of vegetables.

If the plant be small, we reduce it to powder and introduce it into a glass tube sealed at one end and stopped with a cork at the other — AB —

perforated by a hole which lets a small stalk or root — CD — pass through of the same vegetable, which fills the tube and cuts the powder into which it plunges. With this apparatus we cannot obtain sparks, but a current rather strong.

By the aid of this single instrument, there is not a single vegetable substance which we cannot utilize in Electro-therapy.

To close this chapter let us say a word as to internal treatment.

Static Electricity, applied as we have said, suffices nearly always to triumph over nervous and rheumatic troubles which are not connected with any organic lesion. Nevertheless as the quantity of the medicament transported by Electricity is very small, it is sometimes good to give internally a preparation of the same nature as that of the excitator. If the substance of the excitator used is of gold, we administer to the patient a preparation of gold internally, and by this means we obtain a cure, if not more surely, at least, more rapidly.

At other times we are more successful in pre-

scribing internally a substance different from that of the excitator. We take them as an internal remedy the one which is indicated by the nature of the disease. Suppose we have a case of hysteria for which copper is indicated as an excitator; instead of administering copper preparations internally, we succeed better in certain cases in administering the ordinary remedies for hysteria, valerian for instance. By the combined action, of copper, electrically applied externally, and of valerian internally, we succeed very quickly in curing the affection in question, while previously each of these agents applied singly, was without effect. The physician only is able to know from the particular conditions of each case whether it is necessary to give, at the same time with Electricity, the internal remedies and what are proper to prescribe. The only thing that must never be forgotten if we would succeed, and avoid all inconveniences is to give them (remedies) in doses smaller than the habitual doses, because the Electricity augments at the time their absorption and their energy.

VI.

CLINICAL OBSERVATIONS.

It is not our intention to reproduce here observations of all the patients that we have treated. We would go much beyond our outline in so doing. We confine ourselves to choosing such cases as are most particularly interesting, and in which our treatment has been plainly successful.

We begin with the *neuroses*.

We call "*neuroses*" those nervous affections characterized by disorders of sensation, movement, and of intelligence, which manifest themselves during life without our being able to find, by autopsy, anatomical lesions sufficient to account for them.

We begin with the most terrible of the neuroses —epilepsy, frequently called *haut mal*— which is considered incurable.

EPILEPSY.

The child which is the subject of this observation was brought for our consultation November 1, 1871. The parents gave this history of the case: —One day, while the nurse was out walking with it on her arm, she let it suddenly fall to the ground. The child, not then two years old, was greatly frightened, and was immediately seized with a cerebral trouble, which was cured, but left in its wake the epileptic condition. The convulsions became daily more frequent and more violent, and soon the case became one of extreme gravity. Not only did the attacks present a more than ordinary violence, but they were repeated many times each day to such a degree that by their frequency and long duration they allowed scarcely a few hours' respite to the little patient.

The physicians who treated the case prescribed the ordinary remedies, especially belladonna; none of these succeeded; the attacks were not lessened in frequency or intensity. The parents, in face of the inutility of the medicines used,

ceased treatment, doing what they could to make their child comfortable.

In growing up, the crises really became a little less frequent, but they still occurred three or four times a week, and they sometimes appeared two and even three times in the same day. In the meantime, a new condition developed itself—the right arm became atrophied and paralyzed, the right hand was also atrophied, and the articulation of the wrist was crooked so that the palmar surface was turned outwards and the dorsal surface was turned inwards. The whole of this member was actually powerless; the child was unable to help to dress or to feed himself.

This was the condition of young M. when he was presented to us. He was then twelve years old; he had been epileptic for ten years and paralyzed in the right hand for eight years. It may not be without interest to say that during the night preceding the day that he came to us, *i.e.*, in the night of October 31, the child had two epileptic attacks which were violent and of long duration.

physique. He is given a little to strong drinks, and has indulged much in sexual pleasures. It was always immediately after excesses of this kind that he had his three cerebral hæmorrhages of which we are going to speak. The first one occurred in June, 1868. The patient remained several hours without consciousness; then he experienced a general numbness very marked, which disappeared after a few days' treatment.

The second attack occurred a short time after, in November, the same year. He showed the same symptoms as during the first attack, which, as at the first time, yielded to the remedies prescribed.

A third attack, which was graver than the preceding ones, occurred in November, 1869, just a year subsequent to the second one. After this cerebral hæmorrhage, and in spite of the most active treatment, the patient's health was very much altered. Hemiplegia, or paralysis of all the right side, was noticed; furthermore, abolition of memory and loss of speech supervened. Despite all the means put in use, chief of which were

bleedings and frequent purgings, all the symptoms persisted, and when Baron De B. came to demand our counsel he was in the following state : —

1st. The right arm was without power, the right hand could not grasp anything, and for two years Baron De B. had ceased not only to write but even to sign his name.

2d. The right leg was much weaker than the other. The patient was not able to take even very short walks, and moreover he needed the aid of a cane or the arm of a friend. The patient forgot every moment the things he knew best. We have often seen him seeking in vain to recall the names of his most intimate friends.

Lastly, there was aphasia,—*i.e.*, his speech was very difficult, very hesitating. The patient always stammered ; he had the greatest difficulty in articulating the easiest words, and it was absolutely impossible to pronounce all those which contained the letter *r*.

We began immediately the electrical treatment upon Baron De B. Amelioration showed itself during the first few days, and the cure was very

rapid. At the end of the twentieth Electrization he, who had not written his name for two years, wrote three letters, one after another, of four pages each. He walked without a cane, and was not fatigued at all by a two hours' walk. Memory returned with equal rapidity, and he recalled names, dates, and facts which had been forgotten a long time. Finally, speech was less embarrassed.

Improvement proceeded each day, and on November 15, after two months of treatment, Baron De B. did not present a trace of paralysis. All the left side, arm, and leg were as vigorous as the other side. The memory was also clear and as quick as heretofore. Speech only left ought else to be desired, but the trouble was a little sensible. When the weather is beautiful and dry, and the patient has not experienced any emotion, speech is clear and perfectly normal; but when the weather is somber, wet, and above all, as often happens to him, the patient is in a passion, then does it become a little hesitating.

All authors, says Dr. Tripier, in his Electrotherapy manual, agree in rejecting electrical treat-

ment in encephalic paralysis, so long as the lesion whence it proceeds is not on the road to reparation, or even so long as the sum of reparation possible has not been attained. We admit that in these circumstances electrical excitation is without aim, and not free from danger — that the excitation, carried inevitably to the sick part by sensitive nerves, solicits this part to react, and the constitution is thus in a condition which favors a return of the accident or its exacerbation.

"Up to this time," says Dr. Tripier, "we have seen Electricity applied to the treatment of paralysis of encephalic origin, only as an empiric modificator of external symptoms. Will the action of currents upon nutrition, direct, or immediate chemical currents, permit us some day to attack the central lesion and to favor absorption of clots, restoration of softened nerve substance, etc.?"

Static Electricity has settled this question. The electric fluid, as we have called it, is above all things a regulator of the functions and a dispenser of equilibrium. It regulates the circulation, sanguinary as well as nervous, and it aids thus in the

absorbtion of clots. Also, not only have we never had an accident in commencing treatment immediately after the accession of a hæmorrhage, but the cure is much more sure and especially much more rapid than when the patient has waited many months before coming under our care.

These few lines serve to show what an unfathomable abyss separates Static from Dynamic Electricity.

PROGRESSIVE LOCOMOTOR ATAXIA.

Progressive locomotor ataxia has been known for only fifteen years, thanks to the works of M. Duchenne (of Boulogne) and to the illustrious Professor Trousseau, who were the first to give a complete description of it. Before then it was confounded with myelitis and various paralyses. It is, however, a very common affection, and the physician finds it every day in his practice. The fatal denomination, *progressive*, which M. Duchenne gave to it, ought not to belong to it to-day, since we are always able to arrest it in its invading march. We have treated a large number of

ataxias, and we are always successful in imposing a barrier to the disease. If all cases have not received a very great amelioration it is solely because they have not had the patience to continue the treatment long enough. Two or three months, in fact, are not long enough to triumph over a case somewhat obstinate which has resisted every medication.

We report only one observation, which we believe is of a nature to interest the medical world.

M. H. De la M., forty-eight years of age, a man of letters, came to consult us, July 1, 1872.

The first symptoms of *progressive locomotor ataxia* which he is able to recall, date back twelve or fifteen years. They consisted of fugitive intercostal pains, in visual alterations, with a marked tendency to strabismus and to diplopia. Under the influence of moral sufferings of a diverse nature his general state was singularly aggravated. Sleep, appetite, *embonpoint*, had all successively disappeared. He had consulted, by turns, many medical celebrities of Paris, who counseled a season at Ems, 1866. The year following he was

sent to Vichy, without obtaining the least amelioration: he returned suffering even more.

In the meantime, the trouble was becoming worse. The shooting, intolerable pains became more and more frequent and partook of the nature of crises. The general wasting increased, and M. de M. became incapable of intellectual work. The only view of life to him caused a particular repugnance, and the idea of writing even a few insignificant lines inspired an insurmountable disgust. At this time an hæmorrhoidal condition showed itself, and with it a rebellious constipation and a sensible weakening of the bladder.

New consultations advised the waters of Aix (1868). The effect of this cure was a little appreciable. Wintering in Paris was impossible, and the patient was directed to Nice. Pains more and more lively, continuous emaciation, very great troubles of vision, incontinence of urine, and the first disorders of locomotion were now present.

Turpentine vapors and baths were then prescribed, but were discontinued at the twentieth, because of the debility of the patient and the inefficacy of the means.

Upon returning to Paris, a second season at Aix was counseled, with no more result than the first.

A new wintering at Nice, during which M. de M. took 104 Turkish baths. These baths, where the patient went from a sweating room of 70° to a pool of 7° to 8°, accompanied by shampooings and frictions, were not in the least curative, but had resulted in a certain well-being.

Returning to Paris, he commenced electrical treatment (but by Dynamic Electricity) with a well-known specialist. Daily was he electrized for an hour by the aid of a pile of sixty elements, and every morning he electrized himself in bed with a pile of twelve elements. No appreciable amelioration was obtained by this medication.

Driven from Paris by the invasion, the patient was unable to go beyond Orleans, where he was bedridden. He spent the winter, 1870–71, in the most distressing manner. The mind was good, but the body was more and more affected. The walk became more difficult and more disordered, and he fell down very frequently. The shooting pains came almost daily, and an implacable in-

someia was a part of all his nights. At this moment the patient was so discouraged that he resisted all counsel to new medication, and seemed resolved to abandon himself wholly.

It was July 2d that he began our treatment. In about a month an amelioration had already manifested itself. Notable diminution of pains, increased appetite, and a better mental condition were present.

At the end of the first year of treatment the desire to work had returned, and the patient published many important and very appreciable literary works.

We have treated M. de M. eighteen months, but the treatment has been many times interrupted; about every six months we made the patient rest for a month or less. The pains, heretofore atrocious, have wholly disappeared. Two or three times during the winter he has had some returns of the pains, which immediately yielded when two or three electrizations were given at intervals of half an hour. The appetite is good, the *embonpoint* has returned, and the muscles are regaining

their strength. Sensibility of the legs, absolutely abolished, is entirely returned. Incontinence of urine does not exist at all, and the walk is better; the equilibrium alone leaves more to be desired. But the immense results we have obtained, and that no other medication can produce, leaves to us no doubt of the ultimate cure. One readily understands that it takes a long time to eradicate wholly a disease which dates back fifteen years.

Most of the physicians who previously attended M. de M. are themselves astonished at the amelioration obtained, and are the first to say to him, "*Patience and perseverance.*"

RHEUMATISM.

Rheumatic affections are essentially within the domain of Static Electro-therapy. It is indeed rare that they show themselves rebellious any length of time to this medication. Daily are we obtaining complete cures, and we are always sure of obtaining an amelioration immediately. Our observations are abundant, and we are only em-

barrassed for a choice. We limit ourselves to one case only.

M. G., æt. fifty-eight years, of an extremely nervous temperament, was seized, June, 1871, with a muscular rheumatism of the left shoulder and arm. Seeing that the pains resisted the use of anodyne preparations and frictions, the physician resorted to numerous flying blisters upon the shoulder and arm, and prescribed rest for the member.

All these means did not lessen the pain, and three months after, Sept. 20th, when M. G. came to consult us he presented the following symptoms:

1st. Extremely lively pains occupied all the muscular masses of the shoulder and the muscles of the left arm. The pains were increased to such an extent by the least pressure and by the slightest movement, that he knew not in what position to put it to suffer the least.

2nd. Absolute impossibility to execute the least movement with the member. The pains had induced a sort of paralysis of the arm, so that the

patient was neither able to extend it forward, nor to lift it to his head, nor to carry it behind his back. He was unable to dress himself, to draw on his overcoat or to do anything whatever.

3rd. His general state was one of excessive irritability.

We began treatment the same day. As the patient was very irritable, and the pains in the shoulder and arm were extremely lively, and the blisters continued to suppurate, so much so that they sought, by various means, for a long time, to induce cicatrization, we were obliged to employ the gentlest procedures and to lay aside the sparks. The fluidique bath and the calmant currents were almost the only ones used.

Nevertheless, after two months only, M. G. was cured. The rheumatic pains are dispersed, the arm has recoved all its movements, and, lastly, the temperament has been favorably modified. M. G. is much less nervous, much less impressionable.

CONTRACTIONS OF MUSCLES.

Count D., æt. 40 years, suffered, in 1851, from a fall from a horse, a fracture of the inferior third

of the left thigh. For two months the member was immovable in a box (dressing), and when consolidation was accomplished he found shortening of about one centimeter.

From that time up to the day that Count D. came to consult me, he presented the following symptoms:

1. Contraction of the muscles of the posterior part of the thigh, which prevented extension of the member, giving to it a curved form with the convexity anteriorily.

2. Lameness sufficiently pronounced, resulting from this contraction.

3. Pains, very lively, having their seat in lower part of the thigh and the upper part of the foot. They were especially acute on a level with the articulation of the knee, and became extremely acute upon exposure to cold and dampness.

This was the patients state when he came to consult us, on February 1st, 1872. It is necessary to note that at that moment the pains of the knee were extremely severe, in consequence of an imprudence of the Count, who, a few days before,

while out hunting, had been exposed for four hours to a pelting rain.

After two months and a half of treatment all the symptoms which we have enumerated had disappeared, and the patient was freed from pains and his infirmity.

RHEUMATISM — GENERAL DEBILITY — MORAL PROSTRATION.

Colonel T., 59 years of age, presented the following state when he came to demand our care in October, 1871:

1. Rheumatic pains in all the limbs, and in the lower part of the back. The left arm was more particularly affected; it was very painful in the upper part, especially on a level with the scapulo-humeral articulation. The movements of this member are very difficult, and the patient, with the greatest exertion, draws on his overcoat, and moves his arm upwards or behind him.

2. His vision is sensibly weakened. Col. T. is not only obliged to have recourse to glasses rather strong, but for several years his eyes have become

so weak that as soon as he goes into the street they become red and lachrymose.

3. For about a year the patient has been subject to a sort of sadness — spleen — which takes away all his physical and moral energy.

After a month of our medication, Col. T. exclaimed to us:

"I am wholly cured of all my infirmities, and I exaggerate nothing when I state that I believe morally, as well as physically, I am twenty years younger.

HYSTERIA — CHOREA.

Electrical treatment is incontestably the one which agrees best with females who have the *vapors* — or *attacks of nerves* — who suffer in a word, to a certain degree, from hysteria, a most common affection.

Without fear of being taxed with exaggeration, we can say that in all large cities, and in Paris especially, where an agitated, artificial life takes the place of natural existence, there are very few women who are completely exempt; if all do not

have veritable *attacks of nerves*, they all, from time to time, experience some nervous phenomena.

The therapeutic means most vaunted are ether, chloroform, valerian, belladonna and opium. They mitigate ordinarily the crisis, but rarely do they produce an ultimate cure, and sometimes they do not even result in any amelioration. In summing up, there are, in most cases, palliations, temporary calmatives, and not the veritable curative agents.

By means of the new method we rapidly calm nervous phenomena, we diminish the intensity and duration of the crises, we remove them farther and farther, and finally prevent their return. So even among the most impressionable, all women who are acquainted with it are themselves the first to proclaim the success of this agent which immediately relieves them.

Static Electricity is equally the best curative means for chorea, more frequently called St. Vitus dance, which attacks all ages, but chiefly children from ten to twelve years of age.

NEURALGIAS.

Neuralgias are effections characterized by a pain more or less lively, having its seat in the nervous cords. When neuralgic pains are owing to the existence of an organic lesion or to some tumor, there is no way to stop them but to remove the cause which determines and perpetuates them.

But when the neuralgia is essential, there is nothing so efficacious as Electricity whatever the seat of the disorder may be.

We have treated a great number of patients, chiefly women troubled with most painful facial neuralgia, and we have always succeeded. If we electrize them during the crises, we almost always calm them by one or two successive treatments. In continuing treatment afterwards during a time which depends on the gravity and standing of the disease, we almost always triumph over these pains, often atrocious and rebellious to all medicines.

We have been enabled, by our method, to cure facial neuralgias which have existed for over twenty

years, and have rarely left the patient free from pain for a single day. It is useless to say that all imaginable remedies have been tried again and again without the least advantage.

We have also often caused very rebellious intercostal neuralgias to vanish. We ought also to say that they disappear more promptly than neuralgias of the head.

It is the same with neuralgia of the sciatic nerve. At this very moment we are treating M. F., troubled for six months with an intense sciatica, against which have failed, essence of turpentine, vesications, all sorts of frictions, etc. When we had electrized the patient only three weeks the pain had ceased.

The access of migraine rarely resists one or two electrizations, and the malady itself is soon overcome by the continuation of this treatment.

In short, all neuralgias, whatever their seat may be, are cured by the usage of Static Electricity as we administer it.

The length of time of the cure of course varies with the standing of the disease. When it is re-

cent it vanishes very rapidly. A few weeks ago Miss M. besought us to relieve her of a neuralgia which made her suffer horribly and made sleep impossible. As the neuralgia was of only eight days standing she was sensibly relieved by one treatment, and after four treatments she was wholly relieved.

GASTRALGIA.— NERVOUS VOMITING.

M. L., aged thirty-two years, nervous temperament, came to consult us December 1st, 1872.

The difficulty with which he is troubled dates back eight years. For six years it has not been continuous, that is to say, it has left the patient sometimes for two or three months without suffering. But for two years it has not left him a moment of repose. He presented these symptoms:

Weight in the epigastrium; distension of the stomach; aversion to all kinds of nourishment, especially meat; continual alimentary vomitings, which compel the patient to submit to a severe diet. Notwithstanding, there are a continuance

of very abundant liquid vomitings and of an acid taste, also acid eructations, and very lively pains in the stomach, and insomnia.

The physician has used, by turns, purgatives, magnesia, asafœtida, valerian, belladonna, preparations of copper, Vallets pills, anodyne and antispasmodic lavements, raw beef, charcoal, wet compresses to the stomach, etc., but the result has been absolutely *nil*.

Seeing the inutility of these efforts, the physician ordered for his patient the exclusive use of milk. The milk diet arrested the vomitings in eight or ten days, but the cramps of the stomach persisted and were only quieted by taking milk regularly at intervals of an hour and a half. It is easy to recognize a longer space of time by the return of the cramps. So in the night when the patient retires, he is brusquely aroused every two hours by the cramps, which he assuages by swallowing a cup of milk, and so it goes all the night and all the day. The vomitings having ceased, the patient tries by various means to take some aliment, but immediately the atrocious stomach

pains show themselves and the nourishment is rejected as before.

When M. L. came to consult us he had taken for nine months nought but the diet we have indicated. We began immediately the use of Electricity, because of the essentially nervous nature of the disease, of its long standing and of the inefficacy of all ordinary remedies.

From the fifth sitting a notable amelioration was manifest. The patient could lie down and sleep ten hours. Instead of being roused up in an hour or two after by the habitual cramp, he was not aroused till 7 o'clock the next morning, and he had had no pain in the stomach. On the very same day he could, while at his usual work, rest three, and even four hours without taking any milk. Since then the amelioration is more and more pronounced; only once or twice has he had the least pain in the night. Ten days after commencing our treatment, we had M. L. take a raw meat ball and immediately after a tea-spoonful of charcoal. It was all perfectly borne. At the end of twenty days he digested, easily, cutlet, beef steak, etc.

Finally at the end of a month of treatment M. L. found himself cured and ceased to come.

We have treated a large number of similar maladies with success, but rarely has the cure been as rapid.

ASTHMA—PULMONARY EMPHYSEMA.

The success obtained by Static Electricity in the neuroses naturally should engage a trial of it in asthma. So much the more, since it is perfectly demonstrated by experience daily, that the fluidique bath exercises a most beneficial action on respiration, which it makes easier and freer.

When asthma is essential, *i. e.*, exists alone, without organic lesion, without bronchitis, and characterized only by accessions of suffocation, more or less frequent and of a nervous nature, electrical treatment easily brings it to an end.

But, generally, pulmonary emphysema is due to the existence of a catarrh. In this case Electricity alone does not suffice to obtain a cure, still it is the surest means to obtain a notable amelioration and to make life supportable to the un-

happy ones who suffer from this torturous affection.

Among the asthmatics to whom we have given our care is Mr. M. F., Secretary of one of the large Paris journals. He is thirty-seven years old, and has been sick seven years. He has crises of a truly astonishing intensity which return many times daily; the approach of evening always brings one of extreme violence. A few days ago M. F. went home at ten o'clock to retire, when he was suddenly taken with an access of atrocious suffication, which did not terminate till two o'clock in the morning, at which hour he was able to disrobe and go to bed.

M. F. had tried everything in vain. For many years he has been to Eaux Bonnes, Canterets and Mont Dore, without receiving any advantage.

A few months ago he began Electric treatment, and has since breathed more easily. Every morning an electrization of ten minutes procures to him for the whole day a well being unknown for a long time.

It has occurred many times to this patient to be

taken, in mounting the insulator, with a violent attack. We hastened to put the machine in motion and the attack was arrested as by enchantment. This fact has been exhibited many a time. We are also persuaded that if asthmatic patients could always have at their disposition an electrical machine, and could three or four times daily be electrized, they would arrive at, if not a complete cure, at least, a removal of many of the attacks, and would diminish singularly their duration and violence.

When a catarrh exists, as with M. F., it, of course, must be treated at the same time with the ordinary remedies — sulphur waters, tar, turpentine, arsenious acid, etc.

It would be easy for us to report a number of observations of the same nature, for, being occupied much with thoracic troubles, we are often called on to treat asthmatics. But we think the example we have cited suffices to show the efficacy of Electricity in this disease.

DEAFNESS.

Deafness is an affection against which Static Electricity has often been employed with more or less good results. When there exists a vice of conformation, or an organic lesion, there is nothing to be hoped for from its use. Above all, we must, as recommended by Dr. Ménière, be sure that the external meatus auditorious is open (free), that the tympanum is unaltered, that the canal of the eustachian tube is permeable, that air freely reaches the drum, and that this latter allows the entrance of no foreign bodies. We are then assured that it is the auditory system of nerves that is the seat of the disease, and that there exists only a paralysis, more or less complete, of the acoustic nerve, or an atony of the membrana tympani, and, in one or the other case the cure by our method is, as it were, certain.

We have successfully treated a great number of cases of deafness. We cite only one case.

Madame M. came to consult us in January, 1872. Here is what she told us :

In 1861, immediately after long and profound afflictions she experienced, for many months, in the right side of the face extremely, violent neuralgic pains which nothing could relieve. One day while talking with a lady who paid her a visit, she perceived that the diseased side was contracted; however, this sensation being but little painful, not much attention was paid to it.

That evening she sat down at the table as usual, but in carrying the spoon of soup to the mouth she perceived that this aliment escaped outside, and that the movement of the cheek and the right side of the lips was abolished. Her husband observed, moreover, that the upper eyelid could not lower itself, and that the eye remained widely open. They immediately consulted a physician, who recognized a facial hemiplegia or paralysis of the seventh pair.

At the same time hearing on that side was completely extinguished.

The physician immediately began the use of Electricity, but of Voltaic Electricity, and the use of this agent not only procured no ameliora-

tion, but caused to the patient such cruel pains that he was obliged to renounce it after the fifth sitting.

Vesications to the face and to the nucha, iodide of potassium in large doses, and anti-spasmodics of all sorts were employed without much result.

When we saw Madame M. she had for a long time stopped all treatment, and tonics had, a little, ameliorated her condition. The eye was no longer open, but the orbicularis palpebrarum muscle contracted much more feebly than before. The cheek was always placid, and mastication on the diseased side was impossible.

Above all, the most pronounced symptom was the deafness which, far from being diminished, was more pronounced. Madame M. heard no noise on the right side, and was much incommoded by this infirmity. In the hope of curing it, she came to demand our care.

We began electrical treatment by being careful to use only the most gentle means, for this patient was very fearful, always remembering the suffering that she endured from Dynamic Electricity.

When she became confident that no pain was to be feared, we directed sparks to the interior of the ear (Fig. 7), and amelioration was not tardy in showing itself. She began to hear loud sounds, then more and more feeble ones, then the tic tac of her watch, and at the end of two months the deafness, which dated back twelve years, had wholly disappeared.

AMAUROSIS.

We find in the authors a great number of examples of cures of amaurosis by Static Electricity. Wilkinson, in his "Philosophical Essay on Electricity," cites many cases that Hay (of Leeds) and Floyer (of Dorchester), celebrated surgeons, had obtained. Bonnefoy, de Soussure, Wesley and Mauduyt, have also performed some cures. Mauduyt recommends the use of Cavello's method, followed in England, which consists in directing into the eye, widely opened, the current produced by a wooden point.

In spite of the positive observations which have

been transmitted to us, we can only believe that amaurosis may be as easily curable as our predecessors believed it, because, as Dr. Tripier justly remarks, the diagnosis of this affection cannot with exactitude be established in a rigorous manner. But these observations prove in an indubitable manner that, in a large number of cases, Static Electricity has cured the symptom of blindness.

For our part we have treated a great number of persons in whom vision was very enfeebled, and we have always sensibly ameliorated it.

Among others, we treated a patient, M. H., fifty years of age, blind since the age of nine years. A distinguished oculist of Paris engaged us to try Electricity. At the end of one month M. H. affirmed that he could better distinguish day from night. Unhappily for us, it was impossible for him to continue the treatment a longer time as the gravity and long standing of the disease demanded. M. H. left Paris.

In this sort of affections, and in spite of a practice, already long, we are unable to produce a single case of complete cure, but the amelioration

which we have obtained in a large number of cases we are inclined to think that Static Electricity is still the means which offers the most chances of success.

ACTION OF STATIC ELECTRICITY ON MENSTRUATION.— DYSMENORRHŒA.

All physicians who have used Static Electricity in treatment of patients agree in recognizing that this agent is the greatest regulator of menstruation. It has often been given to us to confirm this truth, and we are able to cite numerous cures of *amenorrhœa* and *dysmenorrhœa* obtained by us. We are content to report three observations, which serve as types of nearly all the cases which have presented themselves in our practice.

Observation I.— Mme. C., aged twenty-five years, of good constitution, married six years, has for a few years been very sick at her periods. The menses never appeared at the regular time — sometimes they appeared twice in a month, sometimes they were two months retarded, and their

appearance was always preceded for three or four days by the most violent pains in the uterine region, in the glutial region, in the haunches, and in the upper part of the legs. The patient has used for four years, and without success, all the remedies recommended in such cases.

Mme. C. came to consult us April 10th, 1872. For two days she had felt the horrible pains in the lower belly, in the legs and in the lower part of the back. These were the prodromata of the menses, which were not tardy in appearing. The most careful examination revealing no organic cause, we were obliged to attribute the dysmenorrhœa to a nervous state, plainly pronounced, dating back only three years, according to the testimony of the patient. Narcotics and antispasmodics having been many times uselessly administered, externally and internally, we considered it inutile to try any new remedy and recommended Electricity.

The same day a sitting of ten minutes was given. The pains were quieted, and when the patient returned, the day following, she scarcely suffered.

In the evening the menses appeared and run their ordinary course. The use of Electricity was suspended during the four days of their duration — then the treatment was repeated. The menses appeared at their ordinary time without suffering. To avoid a relapse Mme. C. persisted several months in the use of Electricity, during the eight days which preceded the menstrual epoch, and the discharge continued to appear regularly without any difficulty. Slowly Mme. C. suspended the treatment, and menstruation has always been regular ever since.

Observation II.— Mlle. G., aged fifteen, has grown very rapidly. Her limbs are slender, breasts flat, she sweats often, takes cold easily, and presents all the symptoms of chloro-anæmia. She began menstruating at fourteen years of age, and for six months was regular. At this time the menses ceased and the first signs of chlorosis appeared. Cod liver oil, ferrigunous preparations, quinia, etc., were given without success. The menses have not reappeared.

In view of the well demonstrated inefficiency of

the ordinary medication, we determined upon the daily use of Static Electricity to the young patient for eight or ten minutes. After a month's treatment the menses reappeared without difficulty, the appetite returned, the neuralgias of the head disappeared, the night sweats were suppressed, the leucorrhœa, which had been very abundant for six months and had greatly exhausted this young girl, ceased. The treatment was continued a month longer, at which time the cure was complete. The chloro-anæmia has disappeared. Since that time we have frequently seen Mlle. G. Menstruation is very regular and her health leaves nothing to be desired.

Note, in passing, that Vallet's pills and wine of quinine, which up to this time had been without the ordinary results, were very useful, when used simultaneously with electrical treatment.

Observation III.— This observation is most remarkable, and we cannot too heartily invite the attention of our *confreres* to it.

Mme. D., aged 35, has been afflicted four years with pulmonary phthisis. When this lady called

on us, the disease was far advanced and both lungs were affected. For a year the patient had not left her bed, and had not seen her courses for two years. The pulmonary lesions were so far advanced that it did not seem possible for us to hope to cure this chest affection, which, to speak after the habit of a physician, ought to have a speedy termination in death. The symptom which especially incommoded the patient was hectic fever, which appeared every evening with extreme violence, and was accompanied by very abundant night sweats. The physician of Mme. D. was vainly using every means which science placed at his disposal. We administered new remedies, but without the least success.

We then thought of Electricity, which we have, many times, seen check hectic fever, in the third stage of phthisis. Unhappily, as we said before, Mme. D. had not left her bed for a long time. Nevertheless, as she was very courageous, she was wrapped up in warm furs, borne to a carriage, and brought to us, where she was electrized every day. At the same time we had her take a part of *our*

treatment of affections of the chest. We say *a part only*, for Mme. D. was too feeble to let us hope that she could take the pulverizations.

Under the influence of this double medication the hectic fever disappeared; the appetite, sleep and general strength returned; and, after twenty-one Electrizations, the patient could easily go up and down her stairway, supported simply by the aid of a friend's arm.

But the most extraordinary phenomenon was that at the end of two months, Mme. D. had a return of her menses, which continued five days, and produced a new amelioration in the pulmonary affection.

Unhappily a bad time arrived, and the patient was unable to continue her visits. The menses ceased, and Mme. D. succumbed; but only eight months after, in which time she maintained a better condition, which astonished everybody. A meningeal tubercular affection complicated the primary disorder, of which she died in the month of February following.

CHRONIC DIARRHŒA — ANÆMIA.

M. G., one of the best known journalists of Paris, aged sixty, came to consult us the first time December 1, 1871. He had a sanguine temperament, plethoric constititution, a well pronounced plumpness, and, up to his fifty-eighth year, had never been ill.

In the beginning of 1870, M. G. was attacked with a grave diarrhœa, which, in spite of all the medicines he took, persisted for twenty months, and reduced his weight forty pounds.

When he came to us the diarrhœa had partially ceased; yet it returned once, and even twice, daily. The patient was very much enfeebled, very emaciated, very anæmic, and very much pulled down physically and mentally.

Under the influence of Electric treatment an almost immediate amelioration manifested itself; and after a month, only, we noted:

1st. An almost complete disappearance of the diarrhœa, which only returned at rare intervals, to cease again almost immediately, and in consequence of a single treatment of Static Electricity.

2d. A notable return of general strength.

3d. A return of slight *embonpoint*, very sensible, to the figure.

4th. The disappearance of that icteric paleness of the countenance, which was replaced by a rosy hue, fresh as formerly.

5th. Finally the moral prostration, the sadness, had disappeared at the same time that the general state had improved, and the patient regained his gaiety, lost a long time before.

At this moment, *i.e.*, after a month of treatment, M. G. ceased treatment, to devote himself to curing an eczema, very rebellious, very painful, seated in the left shoulder, and having existed many months. M. G. wrote us:

"My physician, engaged particularly at this moment in curing a trouble of the skin, of which I have told you, has given me directions which will consume a considerable time. I am forced to interrupt the Electrical treatment, but I hope to renew it before long, and in a better condition. While waiting, allow me, sir, to thank you for your care. I am able to appreciate its efficacy, and I shall always be very happy to tell others the profit I have received from it.

Truly, etc., A. G.

INCONTINENCE OF URINE.

Valleix, in his "Guide to Practical Medicine," defines incontinence of urine thus: "The involuntary discharge of this fluid, taking the place of a continued or intermittent manner, without previous retention, or distension of the bladder."

Incontinence of urine is an affection extremely common, especially with aged people. It depends on a great number of causes, among which, especially, must cerebral and spinal lesions be enumerated, which determine paralysis of the sphincter; excesses of all sorts; lastly, vesical paralysis.

These are surgical causes: Calculus, prostatic lesions, etc. Against these latter, Electricity is powerless. It belongs to the surgeon to suppress the cause, and thus relieve the incontinence.

But it is not the same when the incontinence is due to a paralysis of the bladder. There, Static Electricity is truly powerful. We have attended and cured a considerable number of patients with this difficulty.

When the complaint is due only to paralysis of

the bladder, supervening upon age, we have always arrived at a speedy mastery of the case. One of our patients, General Baron de K., not less than eighty-seven years old, had tried all the usual remedies.

With patients troubled with progressive locomotor ataxia, where the incontinence is pronounced, cure is not slow in showing itself. It is nearly almost always on the part of the bladder that the first signs of amelioration show themselves.

Under the action of Static Electricity the most inert bladder very quickly regains its wonted energy, the enfeebled organ is aroused and toned up in a striking manner and the cure is wholly accomplished.

TONIC AND RECUPERATING ACTION OF STATIC ELECTRICITY UPON ENFEEBLED SUBJECTS AND OLD PEOPLE.

Of all tonics Electricity is one of the most powerful and most appropriate to resuscitate vital action. It gives an energy and force, new to all

subjects enfeebled by labor, disease or excesses. Among the examples which we are able to cite in support of what we assert, we will report one which offers a veritable interest from the gravity of the disease, which, till now, has been regarded as incurable.

M. B., the subject of pulmonary phthisis, in the third stage, came to consult us July 16th, 1870. The general symptoms was very alarming; complete inaptency, well pronounced enervation, general breaking down morally, abundant night sweats, hectic fever, etc. In view of the hectic we advised Electricity in conjunction with our treatment of pulmonary phthisis, which the patient accepted with avidity, being greatly desirous of recovering, and of neglecting nothing to secure success. At the end of a few sittings the hectic ceased, and some days later we noted with astonishment, we ought to say, a disappearance of the sweats, a return of the appetite and general strength, and after the twelfth sitting the patient observed in being weighed that she had gained five pounds. Let us say in passing that the patient recovered.

In the convalescence which follows long sickness, *e. g.*, typhoid fever, the vital forces and harmonious action of all the functions are speedily restored by simply attending to this treatment. In the different cases we nearly always give the ordinary tonics at the same time. We thus favor the action of Electricity and abridge the duration of the cure.

In old people the vital forces are lowered and all the organs functionate differently and imperfectly. Electricity agrees well with them, and in numbers of cases we have restored to old people the appetite, sleep and physical energy which seemed to have left them forever.

Physicians of the last century recognized perfectly the tonic and recuperating action of Electricity in old age. They always stated, as we have, that in order to obtain this result it takes usually a long space of time, dependent of course on the age and the degree of enervation of the subject.

To recapitulate, whatever may be the constitution and the temperament of the patient, and

whatever may be the disease, the general and the moral conditions are always favorably modified.

PHYSICAL AND MORAL PROSTRATION.

Under the name of *physical and moral prostration* is meant a morbid state characterized by the following collocation of symptoms:

In the train of great griefs, caused either by the death of a parent or of a friend, or by the loss of money, etc., which make the subjects sad, morose, hypochondriacal. The appetite, sleep and vital forces disappear and the brain ceases to functionate.

Who has not noticed patients the subjects of these vague affections, without a definite name, slowly fading and wasting away day by day? They have vainly used bitters and all the tonics to recuperate their strength, and narcotics against insomnia. Neither distractions nor journeys are able to overcome their insurmountable sadness.

Subjected to Electrical treatment these patients have always and very rapidly established in them a singular amelioration. With the awakening of

the vital forces, good spirits, appetite, sleep, and *embonpoint* returned as desired, and numbers of them have been able to write us, without the least exaggeration, "morally and physically I have been made twenty years younger."

HECTIC FEVER.— PULMONARY PHTHISIS.

We give the name *hectic fever* to a particular fever which manifests itself in the last stage of pulmonary phthisis, and which is caused by the disorganization and suppuration of the lungs. Sometimes this fever is continued with a paroxysm in the evening and night; sometimes it supervenes in paroxysms at times so regular that it simulates, perfectly, an intermittent quotidian. It is always acccompanied by sweats more or less abundant, and later by that diarrhœa, so exhausting, so enfeebling, and so rebellious, that we call it a colliquative diarrhœa.

The appearance of hectic fever in the course of phthisis is of the gravest augury, because it denotes a new impulse to all the other symptoms,

and indicates a morbific absorption, and shows a near dissolution, if we do not promptly triumph over the disease.

Sulphate of quinine, quinquina preparations, arsenious acid, and, in a word, all the medicaments which medicine affords, have been tried without the least success against a state which speedily menaces death.

As we have occupied ourselves a long time with thoracic diseases as a specialty, we have sought for the means of checking this hectic fever, and have found it in the use of Static Electricity.

We have electrized a great number of consumptives exhausted by hectic fever, against which we uselessly employed all things, and we have always seen this fever disappear after twelve or fifteen sittings never to return. The night sweats and vomitings disappear at the same time.

In returning to consumptives their appetite, sleep and *embonpoint*, Static Electricity gives to them, at one stroke, the necessary energy to resist most efficaciously the disease with which they are troubled, not to mention the longer time it gives to the physician to cope with the enemy.

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